MICROHYLID FROGS OF NEW BRITAIN

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[Read 12 October 1967]

SUMMARY

The morphological characteristics of the two species of microhylid frogs occurring in New Britain are reported. *Oreophryne brachypus* was last collected seventy years ago, whilst *Sphenophryne mehelyi* represents an addition to the fauna of the island. The latter species was found in aggregations estimated to reach 300 specimens, and the females sit on clumps of up to six eggs in depressions beneath rotting vegetation.

INTRODUCTION

The only microhylid frogs reported from New Britain are the three syntypes of *Oreophryne brachypus* (Werner) collected in 1897. In the course of a visit to the island in January-February, 1966, the writer collected a series of specimens of this species. Later in the same year Mr. D. Morgan of Keravat on the Gazelle Peninsula collected further specimens and also large numbers of *Sphenophryne mehelyi* Parker, a species previously known from the two types collected in New Guinea.

The present contribution records morphological variation and field observations on the two species. The methods of measurement employed in the text conform to the techniques of Zweifel (1962).

Oreophryne brachypus (Werner)

Material Examined: 22 specimens—South Australian Museum, R.6940, 6942, 6944, 6948, 6964, 6989, 7025, 7065, Pomugu near Kandrian, South New Britain; 6992, 6997, 7000, 7002, 7004-5, 7008, Aliwoh near Kandrian; 7749, 8123, 8440 (5 specimens), Keravat, Gazelle Peninsula.

Variation: The series consists of sixteen adult males, three adult females and three juveniles. The ranges and means of the snout to vent lengths of the adults are as follows: males 19·2-22·3 mm (mean 19·9 mm), females 21·5-22·8 mm (mean 22·0 mm). The syntypes are two adult males and a juvenile and each male has a snout to vent length of 21·5 mm.

These specimens conform closely to Tyler's (1965) redescription of the species; the only additional information relates to the colour of the species. In life *brachypus* has a dusky brown ground colouration with indistinct and slightly darker markings upon it. Of these markings the most common are a narrow trans-ocular bar and a W-shaped patch immediately behind the head. There has been no visible change after a period of fifteen months preservation.

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Field Notes: The males were located at each locality calling from vegetation at heights of from three to eight feet from the level of the ground. The call consisted of a single note, resembled a long squeak and had a duration of about four seconds.

Sphenophryne mehelyi Parker

When Parker (1934) described this species the only specimens available to him were two on loan from the museum at Budapest which he designated type and paratype respectively. The specimens had been reported previously (as *Chaperina fusca*) by Méhely (1901). The herpetological collection at Budapest was destroyed in 1956 and there are no known topotypic specimens in existence.

The specimens referred here to *mehelyi* agree in almost all respects with Parker's description and there is perfect agreement with the reported colouration of the type which, to judge from comparisons with species in the South Australian Museum collection and descriptions in the literature, is quite unlike that of any other species of *Sphenophryne*.

It is pertinent to note that the type locality (Sattelberg) is located on the Huon Peninsula, the portion of New Guinea in closest proximity to New Britain.

Material Examined: 357 specimens—South Australian Museum R.7785-7839, 7955-8009, 8136 (232 specimens), 8438 (15 specimens), Keravat Corrective Institution, Keravat, Gazelle Peninsula.

Variation and Comparison with Original Description: Of the above specimens a series of 55 (R.7785-7839) have been examined in detail and measured. Nineteen proved to be adult males, 27 adult females (of which 21 were gravid) and 9 sexually immature specimens. The ranges and means of snout to vent lengths of the adults were as follows: males 15·5-17·2 mm (mean 16·3 mm), females 17·0-20·1 mm (mean 18·7 mm).

Parker's figure of 20 mm as the size of the holotype was not the snout to vent length. He states in an account of his descriptive methods (1934, p. 16), "The length of a frog is the maximum distance in a straight line between the tip of the snout and the hinder side of the thighs behind the vent." This "total length" would exceed the snout to vent length by about one millimetre, placing the size of the holotype very close to the mean snout to vent length of the females examined. As noted by Zweifel (1962), Méhely (1901) cites a figure of 24·5 mm for the same specimen and, since it is highly probable that his measurement is the "total length" in vogue at that time, this would indicate a snout to vent length of about 23 mm.

The specimens tally with Parker's original description in the following respects: the presence of a denticulated prepharyngeal ridge with an adjacent median swelling; the distance between the eye and the tip of the snout is approximately equal to the horizontal diameter of the eye; the loreal region is oblique; the nostrils are nearer the tip of the snout than the eye; the interorbital space is equivalent to twice the diameter of the upper eyelid; the fingers are short and equipped with small discs; the toe discs are larger than the finger discs; when the hindlimb is adpressed along the side of the body the knee reaches the eye. The colouration of the present specimens agrees in all respects with that of the holotype.

The canthus rostralis of *mehelyi* is said to be rounded but most of the Keravat specimens exhibit only the slightest curvature and in some it is definitely straight. A further point of divergence concerns the length of the fourth finger.

Parker reports that in the holotype it is equivalent to three-quarters of the internarial span, whereas its length exceeds the internarial span in the present material. The tympanum is said to be distinct and, "rather less than half the diameter of the eye". This is true of the majority of specimens, but in those in which the skin on the side of the head is at all loose, the site of the tympanum cannot be detected externally. The skin appears smooth when superficially examined, but minute tubercles are visible when it is examined beneath the microscope.

In Parker's key to *Sphenophryne* the tibia of *mehelyi* is said to equal about half the distance from snout to vent, and to reach the couplet containing *mehelyi* involves agreement with, "tibio-tarsal articulation reaching the eye". As indicated in a previous paragraph, the knee of the adpressed hind limb of the present material will reach the eye, but the tibia length is consistently less than half of the snout to vent length. A frog whose tibia length is exactly half the snout to vent length has a TL/S-V ratio of 0·500, whereas the range of the present material is ·354–·432.

The significance of these points of divergence from the original description cannot be determined until adequate topotypic material is available. At the present time it is considered that the interests of nomenclatural stability are best served by regarding the New Guinea and New Britain populations conspecific.

Comparison with Other Species: Of the thirteen species currently recognised five have snout to vent lengths exceeding 34 mm (*cornuta*, *macrorhyncha*, *palmipes*, *rhododactyla* and *schlaginhaufeni*). The maximum recorded size of the present material (20·1 mm) therefore prevents any confusion with these species.

Sphenophryne brevicrus, *brevipes*, and *crassa* lack dilated discs on the fingers (present in *mehelyi*) whilst *polysticta* has a blunter snout, shorter hindlimbs and a different colouration.

Of the three Australian species reported by Zweifel (1962, 1965), *S. fryi* has shorter limbs (TL/S-V 0·31-0·38, mean 0·346, as opposed to 0·35-0·43, mean 0·390) and attains a larger size than *mehelyi* (of more than 25 specimens reported by Zweifel (1962), only one adult had a snout to vent length of less than 20 mm, whereas 20·1 mm is the maximum for *mehelyi*). *Sphenophryne pluvialis* is evidently also a larger species than *mehelyi* and the specimens reported by Zweifel were uniform in bearing, "ill-defined, and irregular dark brown spots", on the dorsal surface of the body. There is no trace of any dorsal markings on any of the 357 *mehelyi*.

The size and TL/S-V ranges of *robusta* are similar to those of *mehelyi* but the reported colouration of the former (although variable) is evidently quite distinct from that of *mehelyi*.

Field Notes: The specimens were found congregating beneath piles of decomposing vegetation, consisting of rotting grass and reeds laid upon ground covered with leaf mould. The piles covered areas of up to five square yards. As many as 250-300 *mehelyi* were estimated to occur together but, when the vegetation was removed the frogs rapidly dispersed in all directions and rarely were more than 50 or 60 captured at any one site.

Numerous females were found at the base of the piles sitting upon clumps of eggs at the foot of small depressions excavated to a depth of about two inches in the leaf mould. Each egg clump consisted of five or six eggs connected to one another (in the form of a bead necklace) by a very fine cord. Subsequent measurements of the eggs revealed a mean diameter of 3·3 mm for those at a stage prior to gastrulation, and 4·8 mm for those containing well developed juvenile froglets apparently near to emergence. Six eggs is virtually the maximum number that a female of this diminutive species could cover with her body.

Three months prior to the collection of the frogs the area in which they were found was virgin rain forest, but subsequent deforestation had completely eliminated the natural environment of the species. It therefore remains uncertain whether the aggregation of large numbers of frogs in breeding condition is a natural phenomenon, or simply necessitated at Keravat by the reduction in the amount of rotting vegetation occurring in the area.

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